


Basic Information on COVID-19 Pandemic due to SARS-CoV-2 Virus




Información básica sobre la pandemia COVID-19 producida por el virus SARS-CoV-2

Montaño-Luna, Victoria-Eugenia; Aragón-Nogales, Ranferi;
Miranda-Novales, María-Guadalupe

 **Victoria-Eugenia Montaño-Luna 1**
dra.victoria.infectedpediatra@gmail.com
Mexican Social Security Institute, México

 **Ranferi Aragón-Nogales 2**
nogalesranferi@gmail.com
Mexican Social Security Institute, México

 **María-Guadalupe Miranda-Novales 3**
mmirandanovales@gmail.com
Mexican Social Security Institute, México

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Abstract: The World Health Organization (WHO) declared the SARS-CoV-2 virus outbreak as a public health emergency of international concern on January 30, 2020, and by March 11, it was declared as global pandemic. By November 15, 2020, according to the WHO weekly report, there were 53.7 million confirmed cases and 1.3 million deaths reported worldwide. The Region of the Americas is the most affected. The incubation period has been documented between 3 and 6 days. Transmission occurs from person to person by respiratory droplets, which occur when a person speaks, coughs, or sneezes. The clinical presentation can range from a mild respiratory disease, with coughing, headache, and general discomfort, which resolves in a few days, to a severe disease with shortness of breath that requires immediate attention. Global fatality rates reported as of November 26 is 2.3%, being higher in people over the age of 65, and with underlying diseases such as high blood pressure, obesity, and diabetes. There is currently no specific antiviral treatment. Vaccines are in development and several of them have shown promising results, but there is still a need to conclude global trials. Until vaccination can be initiated, prevention and control measures should be continued. The best way to prevent the disease is to avoid exposure to infected or possibly infected people, as the virus can be transmitted even if the person has no symptoms.

Keywords: SARS-CoV-2, COVID-19, pandemic.

Resumen: La Organización Mundial de la Salud (OMS) declaró al brote por el virus SARS-CoV-2 como una emergencia de salud pública de importancia internacional el día 30 de enero de 2020, y para el 11 de marzo hizo la declaratoria de pandemia. Para el 15 noviembre de 2020, de acuerdo con el informe semanal de la OMS, se reportaron de forma global 53.7 millones de casos confirmados, y 1.3 millones de defunciones. La región de las Américas es la más afectada. El periodo de incubación ha sido documentado entre 3 a 6 días. La transmisión ocurre de persona a persona por gotas respiratorias, que se producen cuando una persona habla, tose o estornuda. El cuadro clínico puede ir desde una enfermedad respiratoria leve, con tos, cefalea, malestar general, que se resuelve en unos días, hasta un cuadro grave con dificultad respiratoria que requiere atención inmediata. La letalidad global mundial reportada al 26 de noviembre es de 2.3%; es más alta en personas mayores de 65 años y con enfermedades subyacentes como hipertensión arterial, obesidad, y diabetes. Hasta el momento, no se cuenta con un tratamiento

antiviral específico. Las vacunas están en desarrollo y varias de ellas han mostrado resultados prometedores, pero falta concluir con los ensayos. En tanto se pueda iniciar la vacunación, se debe continuar con las medidas de prevención y control. La mejor forma de prevenir la enfermedad es evitar exponerse a personas infectadas o posiblemente infectadas, ya que el virus puede transmitirse aun si la persona no tiene síntomas.

Palabras clave: SARS-CoV-2, COVID-19, pandemia.

1. Introduction

Coronaviruses are widely distributed and infect humans, mammals and birds; they can cause respiratory, enteric, liver and neurological diseases. According to the International Committee on Taxonomy of Viruses (ICTV), they belong to the order Nidovirales, family Coronaviridae, subfamily Coronavirinae, the latter consists of four genera Alphacoronavirus, Betacoronavirus, Gammacoronavirus and Deltacoronavirus (ICTV, 2020). They are called coronaviruses because of the crown-like appearance they exhibit under the electron microscope. They are enveloped viruses, with an approximate diameter of 125nm, single-stranded RNA genome, positive sense. It is considered the largest genome of RNA viruses with a size of 26-32 kilobases. It encodes four structural proteins that include glycoprotein spike (S), envelope (E), membrane (M), nucleocapsid (N), and other 16 non-structural proteins that participate in viral transcription and replication, such as helicase, and RNA-dependent RNA polymerase. (Su S, et al. 2016; Song Z, et al. 2019) On the basis of genetic sequences, it is known that all human coronaviruses probably have a common ancestor, use natural reservoirs or intermediates in animals, and have the ability to cross the species barrier. (Cui J, et al. 2019).

2. Overview of Coronaviruses

Human coronaviruses through their spike protein bind to one of the receptors, these can be: angiotensin converting enzyme, dipeptidyl peptidase 4, aminopeptidase N and O-sialic acid acetyl, and enter the cell through an endosomal pathway and / or non-endosomal; Once entered, the nucleocapsid and RNA are released in the cytoplasm, the enzymes that participate in the transcription and replication of the virus are synthesized, negative sense RNA copies are produced, structural proteins are produced through subgenomic RNAs that will later be assembled, and the virion is released through exocytosis to the extracellular space. (Zumla A, et al. 2016).

HCoV-229E, HCoV-OC43, HCoV-NL63 and HCoV-HKU1 are distributed throughout the world, they were identified in 1966, 1967, 2004 and 2005 respectively, they are transmitted mainly during the winter, they are a frequent cause of the common cold, with mild symptoms in immunocompetent patients. There are two highly pathogenic and transmissible viruses, the first one reported in 2002 in Guangdong province, China, named Severe Acute Respiratory Syndrome Coronavirus (SARS-CoV) and a decade later in 2012 in

Saudi Arabia the Middle East Respiratory Syndrome coronavirus was isolated (MERS-CoV). (Su S, et al. 2016; Cui J, et al. 2019).

The coronaviruses aroused the interest of medical research by demonstrating their epidemic capacity. In 2003, more than 8,098 cases of SARS-CoV infection were reported, with 916 deaths corresponding to a fatality rate of approximately 10%, classified as the first new infectious disease of the 21st century that has affected 29 countries. In 2012 MERS-CoV infected 2,254 people with 800 deaths, demonstrating a high mortality rate of 35% with 27 countries affected (Song Z et al. 2019).

3. Epidemiological aspects: from the beginning of the pandemic to the end of 2020

In December 2019 in the city of Wuhan, capital of Hubei, China, through an epidemiological surveillance mechanism, cases of pneumonia of unknown etiology were reported, which was defined by the following criteria: fever greater than 38°C, leukocyte count low or normal or low lymphocyte count, radiographic evidence of pneumonia, no improvement in symptoms after antibiotic treatment for 3 to 5 days, and failure to identify a causative pathogen. The first patients were characterized by having a clinical presentation of severe pneumonia and an epidemiological link was found with a wholesale seafood market in the city, in which non-aquatic animals such as live poultry and various types of wild animals were also sold. (Li Q et al. 2020) This association made it possible to alert local health authorities to the suspicion of a zoonotic transmission of a new infectious agent, and the Chinese Center for Disease Control and Prevention was notified on December 31. The first control measure that was carried out on January 1, 2020 was the closing of the market to the public, an environmental analysis, a search for a possible host animal, and disinfection of the place were carried out. In hospitalized patients, samples were taken for research on the causative agent and in just one week, on January 7, 2020, by means of a real-time polymerase chain reaction assay (rRT-PCR) from bronchoalveolar lavage samples, a new virus was isolated, from the coronavirus family that initially received the name of New Coronavirus 2019. On January 12, the genetic sequence of this virus was officially announced for the development of diagnostic tests and later it was named Severe Acute Respiratory Syndrome Coronavirus type 2 (SARS-COV2). Person-to-person transmission was demonstrated early, and a quick contagion growth was observed in the contagion of contacts from patients with the disease. On February 11, the disease caused by this virus was called COVID-19 (Coronavirus disease). The city of Wuhan has approximately 11 million inhabitants and it is considered the main railway and air hub of central China, which favored the spread to other provinces of China and other countries, Thailand reported the first case outside China on January 13, the first case reported in Japan was on January 15, in the Republic of Korea on January 20, and in the United States of America on January 21. (Wu Z, McGoogan JM. 2019) (World Health Organization, 2020).

3.1 Declarations of the World Health Organization

The World Health Organization (WHO) began on January 21 with daily reports on the situation of COVID-19, by January 30 the Emergency Committee was convened and by consensus the outbreak is declared a public health emergency of international importance, with 9,826 total cases, 9,720 confirmed in China (99%), 106 cases outside China in 96 countries, and 213 deaths. (World Health Organization (1), 2020) (World Health Organization (2), 2020). Since the implementation in 2005 of the International Health Regulations, six diseases have been declared with this name, which defines it as a serious, sudden, unusual or unexpected disease, with implications for public health that go beyond the borders of the affected State and may need immediate international action. (World Health Organization (3) 2020). At the end of February there was a gradual decrease in the number of daily cases reported in China and consequently an increase in cases in other countries. The WHO, on March 11, assessed the elevated levels of disease spread in the world and by its severity declares COVID-19 as a pandemic, reporting that day 125,260 confirmed cases: 80,981 in China, 44,279 cases outside of China in 117 affected countries, and 4,613 deaths. (World Health Organization (2), 2020).

3.2. Report of cases and countries most affected

According to the WHO weekly report, as of November 15, 2020, 53.7 million confirmed cases are reported globally, with 1.3 million deaths, the distribution according to WHO regions is as follows: In the Americas region, 22,960,102 confirmed cases with 675,735 deaths are reported, the most affected countries in this region are: United States of America, Brazil, Argentina, Colombia and Mexico; In the European region, 15,047,248 confirmed with 341,488 deaths have been reported. The most affected countries in that region are Italy, France, the United Kingdom, Poland and the Russian Federation; In the case of the South-East Asia region, 10,015,731 confirmed cases and 153,860 deaths were reported, the most affected countries in that region: India, Indonesia, Nepal, Bangladesh and Myanmar; In the Eastern Mediterranean region 3,545,801 confirmed cases with 90,052 deaths were reported with the main affected countries being: Iran, Jordan, Morocco, Iraq and Pakistan; In the African region, 1,398,935 cases with 31,450 deaths have been reported. The principally affected countries are: South Africa, Kenya, Algeria, Ethiopia and Uganda; 798,170 confirmed cases, with 16,377 deaths reported in the Western Pacific region, with the most affected countries: the Philippines, Japan, Malaysia, the Republic of Korea and China. (World Health Organization (4), 2020).

The Chinese Center for Disease Control and Prevention described, on February 11, a series of cases where the first epidemiological characteristics of patients affected by COVID-19 were known, 72,314 cases were reported, it was confirmed in 44 672 cases (62%), 87% of the cases occurred in the age group of 30-79 years. Those under 19 years of age corresponded to 2% of the total cases. Most of them developed a mild clinical presentation in 81%, severe in 14% and critical in 5% of all cases. The general fatality rate initially reported was 2.3%, the main factors associated to the increase in the fatality percentage was

age, being 14.8% for those over 80 years of age, it was also higher in those with underlying diseases up to 10.5% for cardiovascular disease, 7.3% for diabetes, 6.3% for chronic respiratory disease. A high transmission was observed among healthcare workers, with 1,716 affected, corresponding to 3.8%, with a critical or serious presentation in 14.8% of them, and five deaths. (Wu Z, McGoogan JM. 2019).

The United States of America is currently the most affected country by COVID-19, as of November 15, 1,004,852 cases have been reported, with 242,542 deaths. Community transmission was detected in February, spreading throughout the territory, although it has presented variations in the cumulative incidence and mortality among the reporting jurisdictions. (World Health Organization (4), 2020). 66.7% of the cases were reported by 8 jurisdictions that included New York State, the city of New York, New Jersey, Michigan, Louisiana, California, Massachusetts and Pennsylvania. The cumulative global incidence was 119.6 cases per 100,000 inhabitants, the national doubling time of cases was 6.5 days. 52.7% of all deaths were reported in three jurisdictions: New York State, New York City, and New Jersey. (CDC, (1) 2020). On March 23, 2020, the Hospitalization Surveillance Network associated with COVID-19 (COVID-NET) was created, in the first report corresponding to the month of March, a hospitalization rate of 4.6 per 100,000 inhabitants was reported, with higher rates in those over 65 years of age, this age group accounted for 43.4% of the total hospitalized. 90% of hospitalized patients reported by COVID-NET had an underlying disease. (Garg S, Kim L, Whitaker M, et al. 2020) On March 28, the Centers for Disease Control and Prevention (CDC) reported 7,162 patients whose health status was known, that is, 5.8% of the total confirmed cases. It was found that 37.6% had an underlying clinical condition or risk factor, the most frequent being diabetes mellitus (10.9%), chronic lung disease (9.2%) and cardiovascular disease (9%). Of the patients who required admission to the Intensive Care Unit (ICU), it was reported in 78%. In outpatients, 27% had at least one underlying health condition. In 94% of deaths an underlying condition was reported. (CDC), (2) 2020). As of April 9, information about the profession was available in 49,370 patients with COVID-19, from them, 19% corresponded to Healthcare Workers, with a median age of 42 years, and 38% had an underlying clinical condition, 55% reported contact with a patient with COVID-19 in a healthcare setting, 90% received outpatient treatment, 2-5% were admitted to the ICU, and 27 deaths were reported being 10 over 65 years of age. (CDC), (3) 2020).

3.3. Global deaths from COVID-19

The global fatality rate reported as of November 26 is 2.3%, although this rate varies according to each country, and even within the same country it is variable over time and geographical distribution, it has changed as the pandemic has spread and it has been observed that this diversity depends on demographic characteristics and the health systems of each country. As of November 26, 2020; Mexico is one of the countries with the highest fatality rate, with 9.7%. In order to compare mortality in each country, an adjustment is made for every 100,000 inhabitants, currently Belgium is the country with the highest rate

140.75, followed by Spain, Italy, the United Kingdom and Argentina, as can be seen in graph 1. (Johns Hopkins Coronavirus Resource Center, 2020). United States of America is currently the country that has reported the highest number of deaths, adding 18.7% of all deaths.

4. Transmission of the virus

Since the beginning of the outbreak, research carried out has allowed us to know in a preliminary way the dynamics of transmission and information has constantly being updated, Without presenting many variations, an analysis on the behavior of the epidemic in the month of January, in the Wuhan epicenter, determined that the growth of the epidemic was from 0.21 to 0.3 / day, and the Doubling Time; which is defined as the time an epidemic takes in doubling the number of cases, was established in 2.4 days (95% CI 1.9-3.3 days) shorter than that reported in the initial studies. (Sanche S, et al. 2020).

The basic reproduction number (R_0), defined as the average number of secondary cases generated by an index case in a totally susceptible population, has had estimates that vary between 1.9 and 6.5, most report ranges between 2 and 3, which is similar to what was reported with SARS-CoV. Without an intervention, the final attack rate would be set at 75 and 100% in a susceptible population. The incubation period; defined as the time between exposure to the onset of symptoms, has been documented between 3 to 6 days. The series interval; which is defined as the time between the onset of symptoms of successive cases in a chain of transmission, has been reported in the literature between 4 to 5 days. (Park M, et al. 2020).

The fact that the series interval is shorter than the incubation period suggests the possibility of presymptomatic infections. In a study in which viral excretion was evaluated in 94 confirmed COVID-19 patients, classified as moderately ill, the viral load was evaluated by throat swab from the onset of symptoms until day 32, later, viral excretion decreased gradually up to the detection limit of 21 days, similarly, 77 transmission pairs were reported, where it was concluded that infectivity began 2.3 days (95% CI, 0.8-3.0 days) before the onset of symptoms, with a peak of 0.7 days (95% CI 0.2-2 days) before the onset of symptoms, and with a decline in infectivity within the first 7 days. A presymptomatic transmission proportion was estimated at 44% (95% CI 25-69%). However, the study showed some limitations that basically depend on the incubation period and the series interval. (He X, et al. 2020).

5. Clinical aspects of the disease (COVID-19)

The clinical spectrum in SARS-CoV-2 infected patients is wide, ranging from asymptomatic cases to severe pneumonias and even death. The clinical characteristics of the first 425 confirmed cases had a median age of 59 years, with ranges from 15 to 89 years, 56% were men, and initially no one under the age of 15 was reported. Before January 1, 2020, 69% of pneumonia patients were exposed to wet markets in Wuhan; However, in the course of the days the association decreased, and the number of cases with a history of contacts with patients and

even with asymptomatic people increased, in the same way an increase in cases in healthcare workers was reported. (Li Q, et al. 2020). Transmission from person to person has been demonstrated by respiratory drops (Fuk-Woo J, et al. 2020); which is the most common form of transmission when a person speaks, coughs or sneezes, as well as the emission of aerosols, which is not yet clearly defined. It is also transmitted by close contact, which was defined as contact with an infected person at a distance of less than 6 feet (1.8 meters) for a cumulative total of 15 minutes or more in a 24-hour period; to be taken into account from 2 days prior to the onset of symptoms in the infected person or in the case of asymptomatic patients; 2 days prior to sampling; This is independent of the use of protective equipment and has been associated with a high risk of disease transmission. (CDC, (4), 2020).

Vertical transmission has also been suggested and reported; However, the studies carried out report low rates of infection by this mechanism as well as postnatal acquisition, for which reason, isolation between mother and child is not indicated, and it is proposed to continue with prevention measures such as the use of face masks. (Lamouroux A, et al., 2020) (Mahyuddin AP, et al. 2020).

The mean incubation period for the disease varies between 2 and 7 days, being 5 days on average. (Lauer SA, et al. 2020). The clinical manifestations of the disease were described with the first cases and can be highly variable. The clinical criteria established by the Centers for Disease Control in the United States defined a case as a person who presents two of the following: fever (registered or subjective), chills, myalgia, headache, sore throat, smell or taste disturbances), or at least one of the following: (cough, shortness of breath, or trouble breathing) or severe respiratory illness with at least one of the following: (clinical or radiological evidence of pneumonia or acute respiratory distress syndrome). (CDC, (5), 2020).

One of the first published case series of patients with pneumonia, reported 99 confirmed cases that had an average age of 55 years, no one under 15 years, and 51% of the patients had comorbidity, the most frequent were cardiovascular and cerebrovascular diseases and 33% presented some complication, mainly acute respiratory distress syndrome. (Chen N, et al. 2020). In another series of 138 adult patients hospitalized with pneumonia, 36 patients were admitted to intensive care (26.1%) due to organ dysfunction, compared to patients who did not enter intensive care were significantly older in age (median, 66 years vs. 51 years; $p < 0.001$) with a mean time from symptoms onset to intensive care admission of 10 days. (Wang D, et al. 2020).

The most commonly reported symptoms in hospitalized patients include fever (70-90%), dry cough (60-86%), shortness of breath (53-80%), fatigue (38%), myalgia, nausea / vomiting, or diarrhea (15-39%), headache, weakness (25%) and rhinorrhea (7%). Likewise, alterations such as anosmia or ageusia as the only symptom have also been reported in approximately 3% of patients with COVID-19, and gastrointestinal symptoms in variable frequencies. (Mao R, et al. 2020).

The clinical spectrum of the disease in pediatric patients is wide and affects from newborns to adolescents, the symptoms coinciding with those of the adult, with mild upper airway symptoms being more frequent, the severity of the symptoms includes dyspnea and can progress to respiratory distress, septic

shock and death, as well as a multisystemic inflammatory syndrome, the above being more frequent in children with risk factors such as congenital heart, lung or kidney diseases, malnutrition, tumors, diabetes, immunodeficiencies, just as children under 3 months. (Balasubramanian S, et al. 2020) (Shen KL, et al. 2020).

5.1 Laboratory studies

Regarding the alterations observed in laboratory studies, leukocytes are observed in normal or low values with a predominance of lymphopenia, this is considered a characteristic alteration in patients with COVID-19. It is associated with evolution to critical forms and when it has progressive behavior it is generally an indicator of fatal outcome. The expression of the receptor for angiotensin converting enzyme 2 (ACE2) on the surface of lymphocytes favors their destruction more rapidly by direct entry of the virus. (Terpos E, et al. 2020). Lymphopenia and thrombocytopenia (defined by values less than 1500 / mm³ and 150,000 / mm³ respectively), as well as leukopenia (less than 4000 cells / mm³), are the most commonly observed alterations in hematic cytometry.

In the study by Guan W. et al, the frequency of lymphopenia was 83%, followed by thrombocytopenia in 36% and leukopenia in 33%. In severe forms, however, these values were higher with respective percentages of 96, 57 and 61%. Other documented alterations were elevation of alanine-aminotransferase and aspartate-aminotransferase with values greater than 40 U/L in 20%, elevation of creatine kinase (≥ 200 U / L) in 13%, and of lactic dehydrogenase (> 250 U/L) up to by 40%. The elevation of these parameters was not proportionally greater in severe forms of the disease. (Guan WJ, et al. 2020). In determining inflammation-infection markers, one of the most frequently requested parameters is the measurement of C-Reactive Protein. Initial studies in COVID 19 have reported that a value greater than 10 mg/L occurred in almost 60% of mild cases, and up to 80% in severe cases, observing that a greater extent of early-stage lung damage was related to serum levels greater than 100mg/L. (Wang L. et al. 2020). Coagulation alterations are observed in the most severe cases of COVID-19, and when a hypercoagulable state occurs in early stages, it is considered a poor prognostic factor; elevation of D-dimer with levels greater than ≥ 0.5 mg/L is seen more frequently in severe cases compared to mild cases. (Guan WJ, et al. 2020) (Zhou F, et al. 2020). Likewise, alterations in myocardial injury biomarkers are observed, such as increased troponin I, which has been determined as a predictor of critical episodes and coronary heart disease. (Chen C, et al. 2020).

5.2. Imaging studies

Regarding the alterations observed in imaging studies; Chest radiographs show nonspecific alterations that include ground glass pattern, interstitial pattern, as well as consolidation. Characteristic chest tomography images include ground glass radiopacities, air bronchogram, as well as pleural thickening. In the initial stages of the disease, normal studies can be observed in up to 15% of CT scans and up to 40% of chest X-rays. (Shi H, et al. 2020) (Bernheim A, et al. 2020).

The diagnostic standard is the realization of RT-PCR (real-time polymerase chain reaction) test of respiratory samples including oropharyngeal, nasopharyngeal, sputum, bronchoalveolar lavage, and tracheal aspirates. Samples taken from the lower respiratory tract are more sensitive than those from the upper respiratory tract. The sensitivity of the test varies according to the time the test is performed and the time of exposure (Wang W, et al. 2020). Serological tests that detect antibodies to SARS-CoV-2 can also help, both in diagnosis and in measuring response to vaccination. However, the detection of antibodies does not always translate the existence of immunity since not all antibodies produced in response to an infection are neutralizing. IgM antibodies are detectable after the first 5 days of infection, while IgG-like antibodies are observed approximately 14 days after infection. (Sethuraman N, et al. 2020) (Guo L, et al. 2020). In general, its use is not recommended to establish the diagnosis of infection, nor to guarantee that a person is immune.

To date, there is no specific antiviral treatment against SARS-COV-2 infection, different drugs have been proposed and evaluated during the evolution of the pandemic without finding, so far, in the results of the different clinical trials, sufficient scientific evidence that test its effectiveness to recommend its administration. The only drug that is recommended in patients who are hospitalized and require supplemental oxygen is low-dose dexamethasone. A decrease in mortality was found in patients who received the drug in the UK RECOVERY trial. (Wiersinga WJ, et al. 2020).











6. Prevention and control of infection

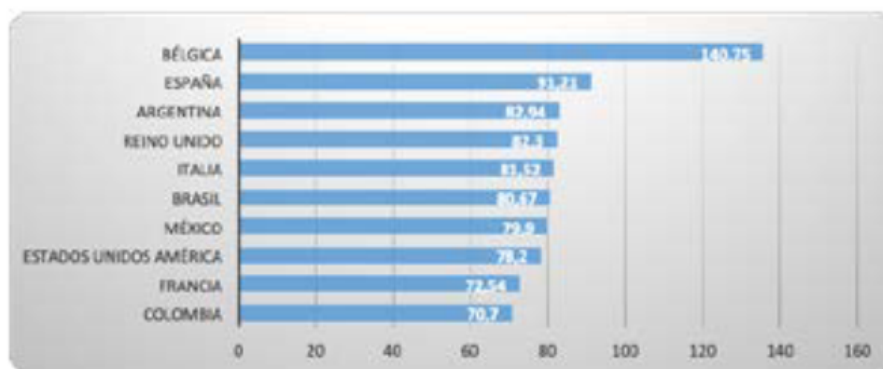
As for prevention, currently, different vaccines are being evaluated through randomized controlled clinical trials in which the reduction in infection, protection against the severity of the disease, as well as the duration of protection will have to be demonstrated. (Hodgson SH, et al. 2020). So far, in the first trials, an efficacy greater than 90% has been reported, at least for 4 of the vaccines that have already reached phase 3, however, the results of these trials will have to be awaited in order to draw definitive conclusions. So far two laboratories (Pfizer and Moderna) have requested emergency authorization from the US Food and Drug Administration. (FDA). The UK was the first country to start vaccination on December 8, 2020.

For now, the best way to reduce the risk of infection is to avoid being exposed to the virus. It is necessary to continue with prevention and control measures, with close monitoring, although in mild cases outpatient management can be given, in cases where hospitalization is required, it should be done in areas designated for its management; with standard, contact and airway precautions when performing procedures that generate aerosols, provide symptomatic treatment and respiratory support and, in severe cases, attend patients in Intensive Care Units.

Table 1

Measures that have been shown to reduce the risk of contagion. (World Health Organization, (5), 2020)

| | |
|---|--|
|  | Keep physical distance of at least one meter from other people |
|  | Avoid confined spaces, with crowds and close contact. |
|  | Use of a face mask that can be made of cloth if you do not belong to a risk group (over 60 years of age, being the primary caregiver of a sick person or suffering from any disease). In the case of healthcare workers, a mask for medical use should be worn, and in the case of care for patients with confirmed COVID-19, a respirator N95, N99, FFP2, FFP3 should be worn. |
|  | Frequent hand washing with soap and water for at least 60 seconds. In the event that the hands are not visibly dirty or contaminated, a hand sanitizer containing 70 % alcohol can be used (for 20-30 seconds). |
|  | Cover nose and mouth with a tissue when coughing or sneezing, and immediately throw it in the trash (preferably in a hands-free basket so as not to touch the lid). |
|  | Avoid touching eyes, nose and mouth. |
|  | Clean and disinfect frequently touched objects and surfaces, such as knobs, water faucets and cell phone screens; using a common household cleaning product spray or wipe. |
|  | Avoid shaking hands and kisses. |
|  | Know and identify the symptoms of COVID-19 (cough, dryness, fever, general malaise) including loss of smell, taste, headache, nasal congestion, or rash. |
|  | Stay home for minimal symptoms. Do not self-medicate. It is advisable to use a face mask when going from one place to another. In case of fever, cough or respiratory distress, seek care by telephone. |



Gráfica 1.

Muertes por COVID-19 por cada 100 000 habitantes en los países más afectados.
datos Johns Hopkins University, al 16 de noviembre de 2020.

Conclusions

COVID-19 has affected a large part of the world's population; Its epidemic behavior raises worry internationally, a significant increase in scientific evidence regarding this disease has been generated, still with many questions to answer.

Since there is no specific treatment so far, and as the vaccination programs advance, the prevention and control measures recommended by international organizations such as the World Health Organization must continue.

References

- Balasubramanian S, Rao NM, Goenka A, Roderick M, Ramanan AV. Coronavirus Disease 2019 (COVID-19) in Children - What we know so far and what we do not. *Indian Pediatr.* 2020;57(5):435-442. DOI: 10.1007/s13312-020-1819-5.
- Bernheim A, Mei X, Huang M, Yang Y, Fayad ZA, Zhang N, et al. Chest CT Findings in Coronavirus Disease-19 (COVID-19): Relationship to Duration of Infection. *Radiology.* 2020;295(3):200463. DOI: 10.1148/radiol.2020200463.
- Centers for Disease Control and Prevention (CDC), (1) Morbidity and Mortality Weekly Report. Geographic Differences in COVID-19 Cases, Deaths, and Incidence — United States, February 12–April 7, 2020. *MMWR Morb Mortal Wkly Rep* [Internet]. 2020;69. (fecha de acceso 18 de noviembre de 2020) Disponible en: <https://www.cdc.gov/mmwr/volumes/69/wr/mm6915e4.htm>
- Centers for Disease Control and Prevention (CDC), (2) Preliminary Estimates of the Prevalence of Selected Underlying Health Conditions Among Patients with Coronavirus Disease 2019 — United States, February 12–March 28, 2020. *MMWR Morb Mortal Wkly Rep* 2020;69:382–386. DOI: <http://dx.doi.org/10.15585/mmwr.mm6913e2>
- Centers for Disease Control and Prevention (CDC), (3) Morbidity and Mortality Weekly Report. Characteristics of Health Care Personnel with COVID-19 — United States, February 12–April 9, 2020. *MMWR Morb Mortal Wkly Rep* [Internet]. 2020;69. (fecha de acceso 18 de noviembre de 2020) Disponible en: <https://www.cdc.gov/mmwr/volumes/69/wr/mm6915e6.htm>
- Centers for Disease Control and Prevention. (4) Coronavirus Disease 2019 (COVID-19). Appendices. (fecha de acceso 24 de noviembre 2020) Disponible

- en: <https://www.cdc.gov/coronavirus/2019-ncov/php/contact-tracing/contact-tracing-plan/appendix.html#contact>
- Centers for Disease Control and Prevention. (5) Coronavirus Disease 2019 (COVID-19) 2020 Interim Case Definition, Approved April 5, 2020. Disponible en: <https://www.cdc.gov/nndss/conditions/coronavirus-disease-2019-covid-19/case-definition/2020/>
- Cui J, Li F, Shi Z-L. Origin and evolution of pathogenic coronaviruses. *Nat Rev Microbiol.* 2019; 17(3): 181-192. DOI: 10.1038/s41579-018-0118-9.
- Chen N, Zhou M, Dong X, Qu J, Gong F, Han Y, et al. Epidemiological and clinical characteristics of 99 cases of 2019 novel coronavirus pneumonia in Wuhan, China: a descriptive study. *Lancet.* 2020;395(10223):507-513. DOI: 10.1016/S0140-6736(20)30211-7.
- Chen C, Yan JT, Zhou N, Zhao JP, Wang DW. [Analysis of myocardial injury in patients with COVID-19 and association between concomitant cardiovascular diseases and severity of COVID-19]. *Zhonghua Xin Xue Guan Bing Za Zhi.* 2020;48(7):567-571. Chinese. doi: 10.3760/cma.j.cn112148-20200225-00123.
- Fuk-Woo J, Yuan S, Kok KH, Kai-Wang T, Chu H, Yang J et al. A familial cluster of pneumonia associated with the 2019 novel coronavirus indicating person-to-person transmission: a study of a family cluster. *Lancet.* 2020; 395(10223): 514-523. DOI: 10.1016/S0140-6736(20)30154-9.
- Garg S, Kim L, Whitaker M, et al. Hospitalization Rates and Characteristics of Patients Hospitalized with Laboratory-Confirmed Coronavirus Disease 2019 — COVID- NET, 14 States, March 1–30, 2020. *MMWR Morb Mortal Wkly Rep* 2020;69:458–464. DOI: <http://dx.doi.org/10.15585/mmwr.mm6915e3>
- Guan WJ, Ni ZY, Hu Y, Liang WH, Ou CQ, He JX, et al., China Medical Treatment Expert Group for COVID-19. Clinical Characteristics of Coronavirus Disease 2019 in China. *N Engl J Med.* 2020;382(18):1708-1720. DOI: 10.1056/NEJMoa2002032
- Guo L, Ren L, Yang S, Xiao M, Chang D, Yang F, et al. Profiling early humoral response to diagnose Novel Coronavirus Disease (COVID-19). *Clin Infect Dis.* 2020;71(15):778-785. DOI: 10.1093/cid/ciaa310
- He X, Lau EHY, Wu P, Deng X, Wang J, Hao X, et al. Temporal dynamics in viral shedding and transmissibility of COVID-19. *Nat Med* 2020;26:672-675.
- Hodgson SH, Mansatta K, Mallett G, Harris V, Emary KRW, Pollard AJ. What defines an efficacious COVID-19 vaccine? A review of the challenges assessing the clinical efficacy of vaccines against SARS-CoV-2. *Lancet Infect Dis.* 2020; 27:S1473-3099(20)30773-8. DOI: 10.1016/S1473-3099(20)30773-8.
- International Committee on Taxonomy of Viruses (ICTV). [Internet]. [fecha de acceso 5 de febrero de 2020] Disponible en: <https://talk.ictvonline.org/taxonomy/>.
- Johns Hopkins Coronavirus Resource Center. Mortality Analyses (fecha de acceso 16 de noviembre de 2020) Disponible en: <https://coronavirus.jhu.edu/data/mortality>
- Klok FA, Kruip MJHA, van der Meer NJM, Arbous MS, Gommers DAMPJ, Kant KM, et al. (2020) Incidence of thrombotic complications in critically ill ICU patients with COVID-19. *Thromb Res.* 2020;191:145-147. DOI: 10.1016/j.thromres.2020.04.013
- Lamoureaux A, Attie-Bitach T, Martinovic J, Leruez-Ville M, Ville Y. (2020). Evidence for and against vertical transmission for severe acute respiratory syndrome coronavirus 2. *Am J Obstet Gynecol.* 2020;223(1):P91.E1-91.E4. doi:10.1016/j.ajog.2020.04.039.

- Lauer SA, Grantz KH, Bi Q, Jones FK, Zheng Q, Meredith HR, et al. The Incubation Period of Coronavirus Disease 2019 (COVID-19) from publicly reported confirmed cases: estimation and application. *Ann Intern Med.* 2020;172(9):577-582. DOI: 10.7326/M20-0504.
- Li Q, Guan X, Wu P, Wang X, Zhou L, Trong Y et al. (2020) Early transmission dynamics in Wuhan, China, of novel coronavirus-infected pneumonia. *N Engl J Med* 2020; 382:1199-1207. DOI: 10.1056/NEJMoa2001316.
- Mao R, Qiu Y, He JS, Tan JY, Li XH, Liang J, et al. Manifestations and prognosis of gastro-intestinal and liver involvement in patients with COVID-19: a systematic review and meta-analysis. *Lancet Gastroenterol Hepatol.* 2020;5(7):667-678. DOI: 10.1016/S2468-1253(20)30126-6. Erratum in: *Lancet Gastroenterol Hepatol.* 2020 Jul;5(7):e6.
- Mahyuddin AP, Kanneganti A, Wong JJL, Dimri PS, Su LL, Biswas A, et al. Mechanisms and evidence of vertical transmission of infections in pregnancy including SARS-CoV-2. *Prenat Diagn.* 2020;1-16. 10.1002/pd.5765.
- Middeldorp S, Coppens M, van Haaps TF, Foppen M, Vlaar AP, Müller MCA, et al. Incidence of venous thromboembolism in hospitalized patients with COVID-19. *J Thromb Haemost.* 2020;18(8):1995-2002. DOI: 10.1111/jth.14888
- Park M, Cook AR, Lim JT, Sun Y, Dickens BL. A systematic review of COVID-19 epidemiology based on current evidence. *J Clin Med* 2020;9(4):967.
- Sanche S, Lin YT, Xu C, Romero-Severson E, Hengartner N, Ke R. Early Release - High Contagiousness and Rapid Spread of Severe Acute Respiratory Syndrome Coronavirus 2 - Volume 26, Number 7—July 2020 - *Emerg Infect Dis.* 2020;26(7):1470-1477. <https://dx.doi.org/10.3201/eid2607.200282>
- Sethuraman N, Jeremiah SS, Ryo A. Interpreting diagnostic tests for SARS-CoV-2. *JAMA.* 2020;323(22):2249-2251. DOI: 10.1001/jama.2020.8259.
- Shen KL, Yang YH, Jiang RM, Wang TY, Zhao DC, Jiang Y, et al., China National Clinical Research Center for Respiratory Diseases; National Center for Children's Health, Beijing, China; Group of Respiriology, Chinese Pediatric Society, Chinese Medical Association; Chinese Medical Doctor Association Committee on Respiriology Pediatrics; China Medicine Education Association Committee on Pediatrics; Chinese Research Hospital Association Committee on Pediatrics; China Non-government Medical Institutions Association Committee on Pediatrics; China Association of Traditional Chinese Medicine, Committee on Children's Health and Medicine Research; China News of Drug Information Association, Committee on Children's Safety Medication; Global Pediatric Pulmonology Alliance. Updated diagnosis, treatment and prevention of COVID-19 in children: experts' consensus statement (condensed version of the second edition). *World J Pediatr.* 2020;16(3):232-239. DOI: 10.1007/s12519-020-00362-4
- Shi H, Han X, Jiang N, Cao Y, Alwalid O, Gu J, et al. Radiological findings from 81 patients with COVID-19 pneumonia in Wuhan, China: a descriptive study. *Lancet Infect Dis.* 2020;20(4):425-434. DOI: 10.1016/S1473-3099(20)30086-4
- Song Z, Xu Y, Bao L, Zhang L, Yu P, Qu Y et al. From SARS to MERS, thrusting coronaviruses into the spotlight. *Viruses.* 2019; 11(1): 59. DOI: 10.3390/v11010059.
- Su S, Wong G, Shi W, Liu J, Lai ACK, Zhou J et al. Epidemiology, genetic recombination, and pathogenesis of coronaviruses. *Trends Microbiol.* 2016; 24(6): 490-502. DOI: 10.1016/j.tim.2016.03.003.

- Terpos E, Ntanasis-Stathopoulos I, Elalamy I, Kastritis E, Sergentanis TN, Politou M, et al. Hematological findings and complications of COVID-19. *Am J Hematol*. 2020;95(7):834-847. DOI: 10.1002/ajh.25829
- Wang D, Hu B, Hu C, Zhu F, Liu X, Zhang J, et al. Clinical characteristics of 138 hospitalized patients with 2019 novel Coronavirus-infected pneumonia in Wuhan, China. *JAMA*. 2020;323(11):1061-1069. DOI: 10.1001/jama.2020.1585.
- Wang L. C-reactive protein levels in the early stage of COVID-19. *Med Mal Infect*. 2020;50(4):332-334. DOI: 10.1016/j.medmal.2020.03.007.
- Wang W, Xu Y, Gao R, Lu R, Han K, Wu G, et al. Detection of SARS-CoV-2 in different types of clinical specimens. *JAMA*. 2020;323(18):1843-1844. DOI: 10.1001/jama.2020.3786.
- Wiersinga WJ, Rhodes A, Cheng AC, Peacock SJ, Prescott HC. Pathophysiology, transmission, diagnosis, and treatment of Coronavirus Disease 2019 (COVID-19): A review. *JAMA*. 2020;324(8):782-793. DOI: 10.1001/jama.2020.12839.
- World Health Organization. (1) COVID-19 situation reports 1. (fecha de acceso 18 de noviembre de 2020) Disponible en https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200121-sitrep-1-2019-ncov.pdf?sfvrsn=20a99c10_4
- World Health Organization. (2) Timeline - COVID-19 (fecha de acceso 18 de noviembre de 2020) Disponible en <https://www.who.int/news-room/detail/08-04-2020-who-timeline---covid-19>
- World Health Organization (3) | IHR Procedures concerning public health emergencies of international concern (PHEIC) (fecha de acceso 18 de noviembre de 2020) Disponible en <http://www.who.int/ihr/procedures/pheic/en/>
- World Health Organization (4) Weekly epidemiological update - 17 November 2020 (fecha de acceso 20 de noviembre de 2020) Disponible en <https://www.who.int/publications/m/item/weekly-epidemiological-update17-november-2020>
- World Health Organization (5). WHO website. Coronavirus disease (COVID-19) advice for the public. Updated November 23, 2020. [Fecha de acceso: noviembre 25 2020] Disponible en <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/advice-for-public>
- Wu Z, McGoogan JM. Characteristics of and important lessons from the coronavirus disease 2019 (COVID-19) outbreak in China: summary of a report of 72 314 cases from the Chinese Center for Disease Control and Prevention. *JAMA*. 2020;323(13):1239-42.
- Zhou F, Yu T, Du R, Fan G, Liu Y, Liu Z, et al. Clinical course and risk factors for mortality of adult inpatients with COVID-19 in Wuhan, China: a retrospective cohort study. *Lancet*. 2020;395(10229):1054-1062. DOI: 10.1016/S0140-6736(20)30566-3. Erratum in: *Lancet*. 2020 Mar 28;395(10229):1038.
- Zumla A, Chan JFW, Azhar EI, Hui DSC, Yuen KY. Coronaviruses-drug discovery and therapeutic options. *Nat Rev Drug Discov*. 2016; 15(5): 327-347. DOI: 10.1038/nrd.2015.37.

Author notes

- 1 Department of Infectology, Hospital de Pediatría - (Pediatrics Hospital), Centro Médico Nacional Siglo XXI - (XXI Century National Medical Center), Instituto Mexicano del Seguro Social -

- (Mexican Social Security Institute), Mexico City, Mexico. [https:// orcid.org/0000-0001-9829-1333](https://orcid.org/0000-0001-9829-1333).
dra.victoria.infectopediatra@gmail.com
- 2 Department of Infectology, Hospital de Pediatría - (Pediatrics Hospital), Centro Médico Nacional Siglo XXI - (XXI Century National Medical Center), Instituto Mexicano del Seguro Social - (Mexican Social Security Institute), Mexico City, Mexico. [https:// orcid.org/0000-0002-3334-5190](https://orcid.org/0000-0002-3334-5190).
nogalesranferi@gmail.com
 - 3 Corresponding Author. Research Unit in Analysis and Synthesis of Evidence, Health Research Coordination, Instituto Mexicano del Seguro Social - (Mexican Social Security Institute), Mexico City, Mexico. <https://orcid.org/0000-0003-3262-2608>.
mmirandanoval@gmail.com